ABSTRACT

The subject matter of the present invention is a fiber Bragg grating sensor 1, 25 which is suitable, in particular, for measuring differential pressures and flow rates v_1 in oil drill holes. The sensor principle according to the invention is based on using a transducer 1 with two pressure chambers 7a, 7b to convert a hydrostatic pressure difference between two liquid or gaseous media 11a, 11b into a longitudinal fiber elongation or fiber compression and measuring it via the displacement of the Bragg wavelength $\Delta\lambda_B$ of at least one fiber Bragg grating 3, 4. Exemplary embodiments are specified which have two fiber Bragg gratings 3, 4 which are sensitive to elongation in opposite senses and which have temperature-compensating transducers 1, and which have a plurality of transducers 1 in a wavelength-division-multiplexing configuration. One embodiment relates to measuring a flow rate v_1 with the aid of a venturi tube 23.

(Figure 1a)